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THE SPECIES OF EUPARYPHUS RELATED TO CROTCHII O. S.

(Diptera, Stratiomyidæ)

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The genus *Euparyphus* has reached its highest development in the southwestern part of the United States, the related *Oxycera* replacing it to a large extent in the eastern states and in Europe. Along with this development, there occurs what seems to be a natural group of species which is restricted to the Rocky Mountain and Pacific Coast region of British Columbia, the United States, and Mexico. These species should not be separated generically from typical *Euparyphus*, but since they form a well defined section of the genus, I am designating this as—

Caloparyphus James, new subgenus

This subgenus includes comparatively large species, 8 mm. or more in length (except *tahoensis* Coq. and *crucigerus* Coq., which measure somewhat less); scutellar spines separated, at base, by a distance at least as great as, usually much greater than, length of spines; thorax black, with four longitudinal yellow vittæ; head yellow with black markings (predominantly black in *obliquus*), and abdomen black, with conspicuous arcuate lateral marking or a once-interrupted arcuate band each on segments three and four (*decem-maculatus* O. S. varies from this pattern). Eyes pilose or bare.

Type, *Oxycera crotchii* O. S.

Ten species are here referred to this subgenus. Of these, *E. decem-maculatus* is unknown to me and has been placed here on the basis of its description. Two lines along which speciation has taken place are in the antennal structure and the abdominal pattern. (1) The antennæ, in one group of species (*amplus*, *currani*, *crucigerus* and *tahoensis*), have been shortened, especially in respect to the terminal two segments (seventh and eighth), whereas, in a second group, the antennæ remain long.

(2) The basic abdominal pattern apparently consists of yellow markings on a black background, in the form of large spots at the base of the first and apex of the fifth, and more or less arcuate bands on the second, third, and fourth, segments. The bands are doubly interrupted in *decem-maculatus*, once so in the other species; the yellow areas furthermore tend to become reduced in size, or to disappear completely, the extreme melanic condition being reached in *tahoensis*, typical form. On this basis, three species groups might be recognized:

- (a) Abdominal bands twice interrupted—*decem-maculatus*.
- (b) Abdominal bands once interrupted; antennæ shortened—*amplus*, *currani*, *crucigerus*, *tahoensis*.
- (c) Abdominal bands once interrupted; antennæ not shortened—*mariposa*, *pretiosa**, *crotchii*, *major*, *flaviventris*.

I am indebted to Messrs. G. E. Shewell, J. N. Knull, and Charles T. Green for information regarding the Curran, Hine, and Coquillett types, respectively.

The valid species may be separated by means of the following key.

1. Abdominal segments three to five each with an isolated median yellow spot; these, together with three lateral spots on each side and an apical one, make a total of ten abdominal spots.....*decem-maculatus* O. S.
- Abdomen with at most eight yellow spots, and without the median ones on the segments..... 2
2. Antennæ no longer than head; terminal segment (eighth) definitely shorter than first and second combined; seventh segment not more than half the length of either third, fourth, or fifth 3
- Antennæ at least one and one-half times length of head; terminal segment (eighth) at least as long as combined length of first and second; seventh segment at least as long as fourth or fifth..... 6
3. Vein R_4 normally wanting; femora black; antennæ with at most one segment yellowish, frequently entirely black..... 4
- Vein R_4 normally present; femora yellow; antennæ extensively yellow basally, at least second and third segments entirely yellow*amplus*

**E. pretiosa* presumably belongs here. Only the first and second antennal segments are present in the type, the only specimen of this species known.

4. Larger species (8 mm.); venter entirely black; face of female with a median, inverted, U-shaped, black marking, but otherwise yellow *currani*
- . Smaller species (6-7 mm.), venter more or less extensively yellow at middle; face of female with a median, inverted, V-shaped, black marking and a longitudinal black spot on each side of it, the spots sometimes connected with each other.... 5
5. Front (♀) black, with an oblique spot on each side near middle, yellow *tahoensis*
- . Front in large part yellow..... *crucigerus*
6. Femora entirely yellow..... 7
- . Femora in part black..... 8
7. First and second antennal segments yellow; frontal black band continuous with black of face..... *mariposa*
- . First and second antennal segments black; black frontal band ending at antennæ..... *pretiosa**
8. Mid-dorsal yellow stripes ending at or before suture; arcuate bands of third abdominal segment separated by a distance much greater than their length; sixth and seventh antennal segments subequal, eighth greatly elongated..... *crotchii*
- . Mid-dorsal yellow stripes extending beyond suture; arcuate bands of third and fourth abdominal segments closely approaching each other, almost contiguous; sixth antennal segment much longer than seventh..... 9
9. Venter black, segments marked at middle with yellow.... *major*
- . Venter yellow, segments sometimes black on anterior margin *flaviventris*

EUPARYPHUS (CALOPARYPHUS) DECEM-MACULATUS O. S.

Euparyphus decem-maculatus Osten Sacken, Biol. Centr.-Amer., Dipt., 1:40, 1886.

Only the male type, from northern Sonora, Mexico, is known. The abdominal pattern is characteristic. The type may be lost. Mr. H. Oldroyd says he cannot find it in the British Museum, where the other *Biologia* types are.

EUPARYPHUS (CALOPARYPHUS) AMPLUS Coquillett

Euparyphus amplus Coquillett, Proc. U. S. Nat. Mus., 25:100, 1902.

Female (previously undescribed). Head yellow; the entire vertex, however, black, together with a prominent marking on front and face which takes somewhat the form of an inverted Y; stem of Y extending from vertex along mid-frontal line to a point somewhat above base of antennæ, where it divides, one fork extending

*See footnote page 50.

along each side of antennæ and to oral margin; from this Y, above antennæ, an angular prominence extends on each side toward the eyes; narrow ocular orbits above antennæ more or less extensively black; cheeks black; oral margin more or less blackish within. Proboscis yellow. First antennal segment black, its apex yellow; second yellow; third, fourth, and fifth entirely yellow, or grading from yellow at base of third to brown on fifth; sixth to eighth black; comparative length of the eight segments, 6:8:8:7:7:11:2:11; entire antenna somewhat shorter than head, as seen from the side. Pile of head yellow, inconspicuous except on proboscis; occipital orbit silvery below. Eyes bare. Thorax black, except the following areas which are yellow: a pair of dorsal stripes which extend almost from anterior margin to a point more than half way from suture to scutellum; humeri and broad lateral stripes extending to wing bases; post-alar calluses and a contiguous triangle pointing in an anterior direction; scutellum, except its narrow base and extreme apices of spines; the larger part of propleura; and a large area comprising narrow upper and broad posterior margins of mesopleura, upper part of sternopleura, and extensive areas on pteropleura, hypopleura, and metapleura. Halteres greenish, stems somewhat infuscated. Legs yellow, at most slightly brownish yellow on femora. Wings hyaline; veins yellow. Vein R_4 present; first posterior vein shortened to a stump, the other posterior veins not reaching wing margin. Abdomen black; first segment more or less yellowish basally; second with a small semi-circular yellow spot on each side; third and fourth each with an arcuate yellow cross-band, more or less broadly interrupted at middle, but length of yellow half-bands much greater than the distance separating them; narrow lateral margins of second to fifth segments, and apical third of fifth, yellow. Venter yellow; narrow bases of segments black. Length, 8 mm.

Described from five females, Spanish Fork, Utah (D. Elmo Hardy); one female, Hooper, Utah, June 30, 1937 (D. Elmo Hardy). The holotype, a male from Chimney Gulch, Colorado, is in the United States National Museum.

Euparyphus (Caloparyphus) currani James, new species

Female. Head yellow; vertex, a broad frontal band, middle of face and oral margin, and cheeks black; frontal band half as broad as front and ending angularly just above antennæ; black area of face taking the form of an inverted U. Proboscis yellow. Antennæ black, second segment somewhat yellowish; ratio of segments, 7:8:8:7:7:9:3:10. Pile of head yellow, inconspicuous except on proboscis; occipital orbits silvery pollinose below. Eyes

with short, scattered pile. Thorax black except the following areas, which are yellow: two longitudinal dorsal stripes which extend from anterior margin to a point half-way between suture and scutellum; humeri and a lateral stripe extending from each humerus to suture; postalar calluses and a contiguous triangle, directed forward; scutellum and its spines; upper margins of mesopleura, broadened at wing bases; and four small spots, one on each sternopleuron and pteropleuron. Halteres yellow, their stalks infuscated. Legs yellow, except basal half of each femur and a small median ring on each hind tibia, which are brownish-black. Wings hyaline, veins yellow. Vein R_4 wanting; posterior veins not reaching wing margin, and first posterior reduced to a fold beyond its base. Abdomen black; a small yellow spot at base of first segment, and one on each lateral margin of second; segments three and four each with narrowly interrupted arcuate yellow bands; narrow lateral margins of all segments but first and a large, semi-circular spot covering approximately apical half of fifth segment, yellow. Length, 8 mm.

Holotype, female, Riding Mountains, Manitoba, July 21 (J. B. Wallis), in the American Museum of Natural History.

EUPARYPHUS (CALOPARYPHUS) TAHOENSIS Coq.

Euparyphus tahoensis Coquilett, Proc. U. S. Nat. Mus., 25:98, 1902.

A black species; the female with a pair of oblique yellow markings at middle of front near the eyes and another pair on lower part of face; a male, which I refer to this species, with frontal triangle yellow and face entirely black. Thoracic markings characteristic of the group.

E. obliquus Hine probably should not be considered specifically distinct. I therefore propose the following subspecific designations:

E. tahoensis tahoensis Coq., loc. cit. Abdomen black, with the margin and an interrupted fascia on the fourth abdominal segment yellow. Type, female, Lake Tahoe, California, in the United States National Museum. Also a male, Summit Prairie, Oregon, August 3, 1935 (Joe Schuh).

E. tahoensis obliquus Hine, Can. Ent., 36: 87, 1904. Abdomen black, with the margin, a small lateral spot on the second segment, and an interrupted fascia each on the third and fourth segments, yellow. Type, Vernon, B. C., in the Ohio State University collection.

EUPARYPHUS (CALOPARYPHUS) CRUCIGERUS Coq.

Euparyphus crucigerus Coquillett, Proc. U. S. Nat. Mus., 25: 99, 1902.

Euparyphus nicolensis Curran, Trans. Royal Soc. Canada, Sect. V: 221, 1927.

A black species, close to *tahoensis*; indeed, I should consider it a subspecies, were it not for the different basic pattern of the pale markings of the head.

Crucigerus with occipital, facial, and frontal orbits yellow, and with a subquadrate spot at base of antennæ which may be confluent with the frontal and facial orbits above and connected below by means of oblique markings with lower part of facial orbits. Thoracic markings typical; abdomen with margins, sometimes base of first segment, and an interrupted vitta each on third and fourth segments yellow.

The presence of the yellow V on the face, by which Curran distinguished *nicolensis*, does not, according to the series of specimens before me, seem to be even of subspecific value.

Type, a female from Colorado, in the United States National Museum.

Distribution. South Dakota: Custer, July 17, 1924. Colorado: Fort Collins, July 24 and 31, 1895 (C. P. Gillette); Florissant, June 21, 1937 (M. T. and H. B. James). Utah: Summit, June, 1926 (Brown); Amalga, June 19, 1937 (C. F. Smith). Washington: Longmire, Rainier Nat. Park, July 27, 1920 (E. C. Van Dyke). Oregon: Wallowa Mts., Baker County, July 4, 1922 (Van Dyke). California: Buck Creek, Modoc County, June 21, 1932 (C. L. Fox); Meadow Valley, Plumas County, 4000-5000 feet (Van Dyke). Arizona: McNary, June 14, 1934 (M. T. and H. B. James). The type of *nicolensis* is from Nicola, B. C.

Euparyphus (Caloparyphus) *mariposa* James, new species

Female. Head black in ground color, but actually in large part yellow, the yellow areas including: occipital, facial, and frontal orbits, the last two being very broad; an inverted, U-shaped area on face, connected below with orbits and above with a small area at base of antennæ; a small triangle above antennæ; and, in the holotype, a small, U-shaped marking extending from each posterior ocellus backward onto occiput. Pile of face sparse, yellow, that of front and vertex black and denser, especially dense on black areas; all the pile, however, short. First and

second antennal segments reddish yellow, the others black; ratio of the segments, 14:13:10:7:8:18:12:42; antennæ one and three-fourth times as long as head. Eyes with short, scattered pile. Thorax with four dorsal yellow vittæ; median pair extending more than halfway from suture to scutellum; lateral pair broadly interrupted behind suture; upper margin of mesonotum bordered very narrowly with yellow, the border expanding, however, into a large area just anterior to wing base, which, in turn, extends onto sternopleuron, pteropleuron, and metapleuron, thus surrounding wing base in the form of a semi-circular band; a prominent yellow spot on each propleuron. Scutellum yellow, narrowly black at base; spines separated by a distance equal to one and one-third times the length of each. Pile of thorax light yellow. Legs yellow, the anterior coxæ black basally, posterior ones slightly brownish. Wings hyaline; veins yellow; R_4 distinctly present. Abdomen black; most of median half of first segment, apical half of fifth, an arcuate lateral marking on each side of second, broadly interrupted arcuate bands on third and fourth, and venter, yellow. Length, 9 mm.

Holotype, female, Mariposa County, Calif., W. M. Wheeler collection, in the American Museum of Natural History.

Paratype, female, Mariposa County, Calif., June 6, 1914 (F. W. Nunenmacher), in the Oregon State College collection.

EUPARYPHUS (CALOPARYPHUS) PRETIOSA Banks

Euparyphus pretiosa Banks, Can. Ent., 51: 65, 1920.

Only the type, a female from Vancouver, B. C., is known. The eyes are pilose; the antennæ are broken off beyond the second segment. Type in the Museum of Comparative Zoology.

EUPARYPHUS (CALOPARYPHUS) CROTCHII (O. S.)

Oxycera crotchii Osten Sacken, West. Dipt., Bull. U. S. Geol. Geog. Surv. Terr., 3: 212, 1877.

Euparyphus septem-maculatus Adams, Kans. Univ. Sci. Bull., 2: 31, 1903 (Synonymy, Banks, Can. Ent., 51: 65, 1920).

The antennæ are broken off beyond the second segment in the type, and this fact was responsible for Osten Sacken's generic reference, quite a natural mistake, as *Euparyphus* and *Oxycera* are indistinguishable except by the antennal structure. Fort Collins specimens in my collection have the following ratio of the antennal segments: 15:10:9:8:7:15:15:40. Type, a female from California, in the Museum of Comparative Zoology.

Distribution. Colorado: Masonville, September 6, 1934; Fort Collins, April 8, 1910 (reared specimens). Washington: Quillene, July 21, 1935 (W. Baker); Shelton, August 31, 1935 (Baker). California: Paraiso Springs, May 7, 1922 (L. S. Slevin); Inverness, August 14, 1910 (Van Dyke); Carmel, Monterey County, February 5, 1917 (Van Dyke) and May 13, 1919 (L. S. Slevin); Jewell Station, Marin County, July 15 (C. L. Fox); Geysers, 1750 feet, May 21, 1897 (W. M. Wheeler). The type of *septem-maculatus*, a male, is from Palo Alto, California. Curran has recorded this species from Vancouver, B. C.

EUPARYPHUS (CALOPARYPHUS) MAJOR Hine

Euparyphus major Hine, Ohio Nat. 1: 112, 1901.

Euparyphus octomaculatus Curran, Trans. Royal Soc. Canada, Sect. V: 222, 1927.

The above species seem to be absolutely synonymous. *E. major* was omitted from Aldrich's Catalogue, and for that reason may have been overlooked by Curran. The type of *major*, from Boulder, Colorado, is in the Ohio State University collection; that of *octomaculatus*, from Penticton, B. C., is in the Canadian National collection.

Distribution. Kansas: Atchison County, July 7, 1924 (E. P. Breakey). Colorado: Boulder, type: North Park, August 30, 1899; Masonville, September 4, 1934; Pingree Park, August 24, 1923 (R. C. Smith). Wyoming: Yellowstone Park, July 20, 1925 (A. A. Nichol). Montana: Anaconda, July 21, 1931 (J. Nottingham). Utah: Provo Canyon (D. Elmo Hardy). Washington: Mt. Rainier, August 10, 1935 (W. R. Camp); Green River Gorge, August 6, 1932 (Baker). Oregon: Horseshoe Lake, Blue Mts., 7500 feet, July 26, 1929 (Scullen); Woodruff Meadows, Jackson County, August 4, 1932 (Chamberlin). California: Los Gatos, September 25, 1910.

EUPARYPHUS (CALOPARYPHUS) FLAVIVENTRIS James

Euparyphus flaviventris James, Pan-Pac. Ent., 12: 89, 1936.

The type series is from Lake City (holotype), Buck Creek, and Davis Creek, in Modoc County, and Grass Lake, Tahoe, California. Type in the California Academy of Sciences. A specimen in the American Museum of Natural History is from Mariposa County, California, June 6, 1914 (F. W. Nunenmacher).